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Saturday, March 13, 1926

8000 YEAR OLD DISCOVERIES MAY LINK MESOPOTAMIA AND INDIA

By E. N. Fallaize

Secretary of the Royal Anthropological Institute, London.

Information from Mesopotamia respecting the progress of the various archaeological expeditions in the field indicates that the excavations now in progress, especially at Kish, where the Weld-Blundell Expedition of Oxford University is at work, are likely to produce results of the greatest importance for the prehistory of this center of early civilization. A number of complete skeletons of early Sumerians have been found and brought to England where they are now being studied. It is expected that they will throw much light not only on the physical characters of the early inhabitants of Sumeria, but they will provide material towards solving the problem of the racial origin of these people which is at present unknown.

Owing to the differences in physique and headform between them and the Semitic inhabitants of Early Mesopotamia, it has been thought that they were derived from the mountains of Asia Minor or from Central Asia, whence they swept down the valley of the two rivers Euphrates and Tigris to found the kingdom of Sumeria. On linguistic grounds attempts have been made to connect them with the Chinese. It has also been suggested that elements of Sumerian culture may have been derived from India, where in the Indus Valley seals with inscriptions like the Sumerian hieroglyphs, vases, and other objects resembling objects from Mesopotamia have been found. It is now announced that about a dozen skeletons have been found on these Indo-Sumerian sites in India, and it will therefore be possible to see whether any resemblances in these early human remains give ground for attributing any racial affinity to the early peoples of India and Mesopotamia, or whether the evidence points to a cultural contact only.

A find at Kish of equal if not more importance is a complete series of perfect specimens of the beautiful early Sumerian pottery painted in monochrome or polychrome in geometric design. No large quantity of perfect specimens of this pottery has been found before and the present find gives a complete series of the various forms. This painted pottery is one of the most important pieces of evidence for the cultural history of the Early East. It is very widely distributed but the chronological relation of its occurrence on different sites had not hitherto been determined. It occurs in Turkestan at Anau in a very early deposit which may date back as far as 6,000 B. C. or even earlier. It was also found in the second period at Susa in Persia by the French Delegation which was excavating under the late M. de Morgan, and it occurs on several sites in Mesopotamia, such as Ur, Tel-el-beid, and Abu Shahrein. It is now possible to say definitely that not only is it related to the painted pottery of the second period of Susa, but the forms indicate beyond doubt that it is related to the fine and beautiful pott-

ery of the first period on that site. This is the first definite piece of evidence to this effect which has come to hand, and is contrary to what has been the generally accepted opinion. The form of the plano-convex bricks with which the pottery was found dates it conclusively as belonging to a period not later than 3,500 B. C., when this form of brick was still in use in Mesopotamia. Sumerian inscriptions were found with the pottery, and these, therefore, are the earliest hieroglyphic writing known in Mesopotamia up to the present.

ETHER MEASUREMENTS REVEAL PLANETARY MOTIONS

The sun, and the solar system with it, is moving through space with a speed of over a hundred and thirty miles a second, towards a point in the direction of the constellation Draco, the Dragon, which partly encircles the north pole. This is one of the conclusions reached from recent experiments by Prof. Dayton C. Miller, of the Case School of Applied Science in Cleveland, and described by him in a recent radio talk given through station WCAP, under the auspices of Science Service and the National Research Council.

The experiments of Prof. Miller have been made at the Mt. Wilson Observatory in California since March, 1921, and involve the use of a delicate instrument called the interferometer and invented by one of Prof. Miller's predecessors, Dr. A. A. Michelson, now professor of physics at the University of Chicago. When the experiment was first performed by Prof. Michelson in 1887, an effort was made to detect the motion of the earth through the ether, which is supposed to pervade all space, and to be the medium through which light and similar forms of radiation are transmitted. However, though the apparatus was delicate enough to detect the expected motion, only a negligible drift was found, and one of the ultimate results of the effort to explain this anomaly was the Einstein theory of relativity.

In 1905, Prof. Miller, and the late Prof. Edward W. Morley, who collaborated in the original set of experiments, repeated them on a hill 200 feet high near Cleveland, and found a slight effect, but nothing further was done until 1921 when the present series was started at Mt. Wilson, more than a mile above sea level. These have resulted in what is interpreted as a marked drift of the ether and the explanation offered has been that under conditions such as those in Cleveland, and at sea level, the ether tends to be dragged along, but on a mountain top, there is nothing to obstruct it, and so it drifts by.

The general direction and amount of the drift has been determined by Prof. Miller by comparing measurements made at different times of the day and year. In the series of experiments which he conducted last year, Prof. Miller stated, over 100,000 readings of the instrument were made. "This required," he said, "that I should walk, in the dark, in a small circle, for a total distance of 100 miles, while making the readings."

The general motion of the earth, and the rest of the solar system, which Prof. Miller finds is in good agreement with measurements made by astronomers of the motion, and is towards a point in the sky having the right ascension, the celestial equivalent of longitude, of 262 degrees, and a declination, which corresponds to latitude, of 68 degrees north. Other determinations of the motion and its direction have been made by measurements of the motions of the stars in the sky, and of the star clusters. "These three determinations of the absolute

motion of the system," said Dr. Miller, "are all in the same general direction and lie within a circle having a radius of 26 degrees. The assumed velocity of a hundred and thirty miles per second is about seven times the velocity of the earth in its orbit, and it is of a reasonable magnitude."

BLUE AND RED FLOWERS COLORED WITH SAME DYE

It makes no difference whether a flower is red or blue, its hue is due to the same fundamental substance. Its redness or blueness depends on the chemical nature of the plant sap. For example, deep red dahlias and blue cornflowers contain the same pigment but the sap of the dahlias is acid and that of the cornflowers is alkaline; and this makes all the difference. Intermediate shades depend on the degrees of acidity or alkalinity.

The name of this versatile plant pigment or dye is "anthocyanin", according to Prof. R. Robinson, well-known English physiological chemist, who told of investigations in this branch of plant physiology before the Royal Institution of Great Britain. This strange-looking word is made up of two simple Greek roots, which translate into "flower-blue", which is exactly descriptive of one of its phases.

There are really many distinct anthocyanins, Prof. Robinson explained, though chemically they are practically identical. By analysis they can all be shown to be derived from three fundamental substances, which are closely related to each other.

There appears also to be a fourth member of this group of basic flower dye-stuffs, which has long been exploited by tropical Indian tribes as material for rouge, which, however, is used among them by gentlemen only.

"The Indians of South America in the vicinity of the Orinoco prepare a red plant pigment called 'carajura' or 'chica'," Prof. Robinson told his hearers. It is so valuable a commodity that it is said of a poorer native, 'he can only paint half of his face!' The chemical examination of carajura by Prof. A. G. Perkin, has resulted in the isolation of a red crystalline constituent called carajurin. The molecules of the salts of carajurin with acids have been proved to contain the characteristic nucleus of the anthocyanidins and apparently carajura proclaims a fourth anthocyanidin. It is unique both as a cosmetic and as an object of scientific research."

ANCIENT BEAR BONE FETISH GAVE MAN ARTISTIC URGE

By George Grant MacCurdy
Professor of Anthropology, Yale University

Discovery of a 100,000 year old lower jaw bone of a cave bear just made by Emil Baechler of St. Gallen throws new light on how man first came to be an artist.

This ancient relic unearthed by Dr. Baechler in the floor debris of a cavern at Wildenmannlisloch, a mile above sea level in the canton of St. Gallen, Switzer-

land, has a striking resemblance to a human head and body. The hollowness of the lower jaw bone's socket holding the canine tooth of this ancient bear must have suggested and formed to the eyes of the early dwellers of the cave the neck and chin of man.

This strange chance resemblance undoubtedly caused the bone to be prized or even worshipped; in fact, the piece bears evidence of a considerable amount of wear as if it had been carried as a fetish.

Fortuitous resemblances in nature such as this must have stimulated early man's nascent artistic bent and probably made him try his own hand at being an artist.

Flint nodules resembling some animal form have been found associated with artifacts of the Old Stone Age. They have also been found in deposits of the New Stone Age. Once detected, natural effigies would be gathered and treasured by the superstitious dwellers of that ancient age and means would eventually be found to supplement and improve on nature's haphazard creations.

The Paleolithic hunter who treasured the bear jaw bone could have inhabited Wildenmannsloch only during an interglacial epoch - presumably the last one, known as the Riss-Wurm interglacial. The deposit can also be dated from the fact that it rests on a sterile glacial deposit, called Riss, and is covered by a sterile glacial deposit, called Wurm. The piece in question is probably 100,000 years old.

BARN SWALLOW AND BOBOLINK LONG DISTANCE FLIERS

When the barn swallow and the bobolink are numbered among the arrivals from winter quarters that are coming in almost daily now, they will have completed a journey of over 10,000 miles round trip, from northeastern United States to Argentina and back. A few individuals among the yellow-billed cuckoos, olive-backed thrushes, nighthawks and cliff swallows may have penetrated so far south but the barn swallows and bobolinks invade the region of pampas and the tango en masse.

Under the auspices of the United States Biological Survey, Dr. Alexander Wetmore of the Smithsonian Institution has been carrying on an investigation of the migratory habits of northern birds in their southernmost ranges. Most of the really long distance fliers are shore birds, he says, with notable exceptions mentioned above. The majority of the common birds with which most of us are familiar stop before they get very far south of the Equator, and sojourn in the north of South America.

The results of Dr. Wetmore's investigations in the southern part of South America are contained in a recently issued illustrated bulletin of the Smithsonian Institution. In it he claims that northern birds have three main routes of southward travel; They may go down the eastern coast of South America via the Brazilian coast, or along the Pacific taking in the mountain scenery of the Andes en route, or they may go straight south down through the central part of the continent.

From Dr. Wetmore's observations, it would seem as if the bulk of the migratory bird population contrived to pass south with the coming of fall to the northern hemisphere and to follow the advance of the southern spring south of the Equator, remaining in their winter location through the southern summer. With the coming of colder weather in February and March they withdraw northward to their breeding grounds in the United States and Canada, thus managing to live in a Palm Beach atmosphere of eternal spring and summer.

MOON VISIBLE DURING POLAR WINTERS

The six months night which residents near the north pole enjoy during the winter, and which will soon come to an end, is not as dark as it might seem, for they have the moon above the horizon for two weeks at a time. To an observer at the pole, it would be seen to rise at the first quarter, would wax to full and wane to last quarter again before it set below the horizon. This is because of the fact that when the moon is full, it is on the side of the earth directly opposite the sun. This can be verified by anyone, for when the moon is full, it rises as the sun sets, and is on the meridian, directly south, at midnight. At first quarter the moon is directly south as the sun sets, while it sets at midnight; and at last quarter, Luna appears above the eastern horizon at midnight.

During the autumn and winter months, while the sun is south of the equator, it is not visible at the north pole, but it is not dark all of the time, for the sun must be about 18 degrees below the horizon before the sky is actually dark. When it is less than 18 degrees, twilight occurs. During the past winter, the sun was below the twilight limit from November 14 to January 29, making a total of only about two and a half months of actual night. With a bright moon during half of this time, the pole has a total of only a little over a month of actual darkness during the year. However, there is less heat in the winter, and so arctic explorers find the summer most comfortable for their work. Perhaps the day will come, however, when the transpolar air route to Europe and Asia will be popular, since the light will make possible flying at all times of the year.

STUDIES "HEARING" OF UNSPOKEN WORDS

How we "hear" words that are never spoken is being studied by Prof. J. E. Coover, of the department of psychology at Stanford University, who for over ten years has been studying psychic phenomena. When fragmentary sentences are spoken to the hearer, who has heard such sentences complete in the past, unconsciously supplies the missing words. Somewhat similar is the process when a person is heard over a telephone line with poor connections, or when at a great distance, for not all sounds carry with equal facility.

In Prof. Coover's experiments to determine just how many sounds unsaid may be heard, or rather how sounds emitted are not heard, but are "supplied" by the second conversationalist, he employs the English language, utilizing 200 consonant sounds, or "nonsense syllables". Half of these begin with a vowel, half with a

consonant. Those beginning with a vowel end with a consonant, and vice versa.

Because he has noted that initials and numbers are understood with greater difficulty than completed sentences, he tries the fragmentary sounds, having one individual speak them through an air space, a closed door, telephone or dictating machine.

He mixes the sending, some "straight language" with the nonsensical syllables. If the listener hears all of the language but does not understand the single syllables, it shows, according to this scientist, that much of the dictation is "supplied by the brain."

OYSTERS GROW BEST IN HARBORS

"Back to nature" is the slogan of the experts who are trying to coax the oyster back to its old time productivity. Oysters live, thrive, increase, and multiply best in the brackish waters of our coastal estuaries and harbors, according to H. F. Prytherch of the U. S. Bureau of Fisheries. At the experimental shellfish laboratories at Milford Harbor, Conn., experiments have been made to determine if oysters cannot be induced to become as plentiful in their native haunts along the New England coast as they were in the days of Massasoit and Miles Standish.

The oyster spawn is microscopic in size and for two weeks exists in a free swimming larval state carried hither and thither by the waves and the tide. The great key note of oyster culture is to get the largest number possible of the baby oysters to "set" upon some stationary object at the end of the free swimming stage. Once set the oysters cannot move of themselves. The full grown marketable adults can readily be collected from whatever planted material, usually old oyster shells, has been used to catch the young ones or "spat".

At Milford Harbor for the past four years many experiments have been carried out in the study of the life history of the oyster, particularly the free swimming stage. Very few larvae are found in the water in the interval between spawning and the time for them to set. The investigations this summer show that the larva lives part of the time on the bottom during this period, pulling itself along by means of a muscular foot, like a clam. This interesting discovery has enabled investigators to understand much better the relationship of spawning beds and setting areas and the effect of tides and currents on distribution.

Rocks, shells, glazed tile, and objects of many sorts were tried out as collectors for the "spat". Birch brush, bearing dozens of tiny oysters planted in rows in the tidal flats, presented the aspect of what might be called an oyster garden. The outstanding results of the summer's work show that millions of seed oysters can be produced when natural conditions of breeding are reproduced. Protection of these inshore areas is essential if the oyster is to continue to be a delicacy of the American table.

Thousands of dollars have been spent by commercial enterprises sowing oyster shells to collect seed oysters, with steadily decreasing results. In years past

when the oyster industry has been successful in obtaining yearly crops of oysters there were large natural beds located in the harbors, bays and river mouths where the conditions were favorable for the production of a vast quantity of spawn. Today these valuable areas have been destroyed by excessive pollution from factories and by overfishing so that only the deep water beds remain for the production of seed oysters.

When spring and summer weather conditions in deep beds resemble those normally existing in the harbors and estuaries, oyster culture is successful, but unfortunately this happens only occasionally. Connecticut recently passed a law enforcing the control and elimination of pollution in its harbors. The enactment and enforcement of such legislation in other oyster growing states would do more than any other one thing to increase the existing supply of oysters. This spring the Bureau of Fisheries intends to undertake an investigation of the coast of South Carolina to ascertain the possibilities for oyster propagation in the South. A similar survey of Texas is already under way.

CALIFORNIA CHILDREN TAUGHT LESSONS BY RADIO

Can one teacher broadcasting from a radio station teach penmanship, history or science to hundreds of children in school rooms all over a city? V. E. Dickson, of the Berkeley, California public schools, who attended the meeting of superintendents of the National Education Association, in Washington, says that it is being done in California public schools with considerable success.

The radio instruction is not in the form of a lecture, as a rule, but is so planned that the children are given directions and take an active part in the long distance lessons just as in ordinary class work. Schools of the city are equipped with wires leading from a central receiving radio set to a loud speaker in each classroom, and the radio lessons are broadcast several times each week.

Mr. Dickson predicts that radio will not supplant regular class room teachers, but it will be extensively used in public schools.

"Receiving sets sometimes balk, and to have a whole class waiting impatiently for those waves which once passed are gone forever is embarrassing to the receiving operator," he admits. "But," he adds, "I can remember twenty-five years ago when automobiles frequently acted in similar balky fashion. They do less of it now."

Some of the advantages of school room radio, pointed out by Mr. Dickson, are: The lessons are necessarily presented by the best teachers in the city, because of the difficulty of "getting instruction across" by the voice alone. Consequently, all of the children have the benefit of some instruction by experts in different subjects. Teachers also benefit by listening to the carefully planned lessons prepared by these experts, and the teachers have the opportunity to observe their own pupils at work in a manner not possible when they are busy teaching.

Even the adults of the city are taking an interest in the grammar school lessons, because of the different ways of doing things since they went to school,

Mr. Dickson has found. Some of the parents write to inquire if their papers will be corrected if they send them in to their children's school teachers.

EARS GET TIRED AFTER HARD DAY, SAY SCIENTISTS

Nobody has proposed an eight hour day or a forty-eight hour week for weary ears--so far. Nevertheless, ears do suffer from fatigue, and when they are tired they don't work so efficiently, according to experiments being conducted at the University of Wisconsin by Drs. G. A. Goldsmith, L. S. Luenzman, L. Sammons, and B. W. Zimmerman.

Using as their apparatus a watch mounted on a moving carriage, they confirmed a belief that keenness of hearing is less at night and at the end of the week.

Mental work always causes a decrease in keenness of hearing, the scientists find. Severe exercise has the same effect. Moderate exercises may sharpen hearing but this depends upon the amount of exercise and the condition of the subject.

The ears are a rather delicate barometer of physical fitness, the tests indicate. Diminished power of hearing may give warning of approaching bodily or mental fatigue some hours before the individual is aware of any change in his condition.

SCHOOL ROOMS BADLY LIGHTED, SAYS EXPERT

The lighting of school rooms in the United States, especially the provision made for artificial lighting, is far below the standards considered economical by up-to-date business establishments, according to E. J. Dailey, Jr., illumination expert of New York, who attended the National Education Association meeting.

"Wisconsin is one of the very few states that has a lighting code controlling the standard of lighting for school buildings," said Mr. Dailey today. "If more states would enact a similar code many of the present evils would be eliminated."

"Investigations have shown that healthy eyes, under normal conditions, use up from 10 to 15 per cent. of the whole nerve force generated by the body, but the eyes may use up as much as 50 per cent. of this force if subjected to undue strain. Other studies have shown that at least one-fourth of our school children have defective vision, and much of the trouble can be traced to improper lighting either in the school or in the home."

Young children, especially, require the best lighting conditions, said Mr. Dailey, as it takes them longer to become acquainted with unfamiliar pictures and characters.

"Most of their early training consists of impressing on their minds--through their eyes--mental pictures," he explained. "The speed with which they can absorb these pictures and the clarity of the impression on their minds have considerable bearing on the intellectual progress they make."

DISCOVER RUSSIAN SITE POPULAR WITH PREHISTORIC MEN

Habitation by prehistoric people as far back as 100,000 years ago of a site on the Volga River near Samara, in Russia, is revealed by the researches of Miss Vera P. Misinova, and described by her in a report received by Dr. George Grant MacCurdy, professor of anthropology at Yale University and director of the American School for Prehistoric Research.

The place investigated by Miss Misinova is known as Postnikova, and is important because of the sequence of ancient cultures found there. It is located at the junction of a ravine, known as the Postnikov, with the Volga. This seems to have made it a desirable habitation from very early times.

On the top are remains of the late iron age, dating from about 500 B. C., Dr. MacCurdy explained, but on digging down there were found remains of human habitations in the bronze age, probably dating from about 2500 B. C. to 1200 B. C. Under this layer were found relics from the early neolithic period, such as flaked arrowheads, but no pottery or polished stone implements were present. This layer probably dates back to about 5000 B. C. to 15,000 B. C.

A curious feature of the place, according to Dr. MacCurdy, is that the layer under this was merely a deposit of rubble, with water worn fragments of limestone, but devoid of any products of human workmanship. Yet under this was found a layer probably belonging to the paleolithic, or old stone age, which dates back from 25,000 to 100,000 years. This contained specimens of cruder chipping than the upper layers, and, he says, is of the greatest interest.

"Miss Misinova and her small band of fellow students deserve the greatest credit for what they have been able to accomplish during the last few summers in the field," said Dr. MacCurdy. "Last summer they covered more than 300 miles in the northwestern part of the Samara district on foot."

SPLEEN AN AID IN RESISTING TUBERCULOSIS AND TUMORS

Modern medical science is at last unraveling that physiological mystery of the ages, the purpose of the spleen in the human system.

It has been known since classical times that the spleen could be removed without any apparent ill effects on the patient. Various conjectures, all more or less erroneous as to what its purpose could be in the human anatomy, have come down to us. By the last half of the 19th century it was definitely established that it had something to do with the purification of the blood as well as the formation of some of the blood cells, and though it was not necessary for life these functions after removal were taken over by the bone marrow and other organs.

In a resume of the more recent work done on this mysterious organ, by Dr. E. B. Krumhaar of Philadelphia, we find that the spleen is an important source of antibodies, those little-understood elements in the blood that help kill off bacteria. Laboratory experiments seem to show that the spleen plays a considerable part in resistance to such infections as tuberculosis and also to the growth of tumors. It has been found that tumor grafts make much less growth in the spleen than in any other organ, and that its removal definitely cuts down the resistance to tumor inoculation. Some experimenters believe that it contains a substance

actually destructive to tumor cells but this has not yet been conclusively proved.

Two doctors of New York City, Dr. S. Shapiro and Dr. F. H. Frankel, have tried to ascertain the effect of feeding extracts of spleen and bone marrow upon the formation of red corpuscles. Their patients showed an increase in the number of red cells while being fed the extract but the count went down as soon as the dose was stopped. The definite establishment of the fact that such extracts contain a substance which will increase the production of red corpuscles would be of inestimable value in the treatment of many diseases, particularly anemia.

TABLOID BOOK REVIEW

SCIENCE AS REVELATION; by John M. Watson. The Macmillan Co., New York, 1925. 303 pp., \$2.25.

This is a very interesting attempt to show that the truths of science are as much a revelation of divine will as anything in sacred writings. In separate chapters the author presents the views of the astronomer, physicist, chemist, biologist and other scientists, as he conceives them, ending with chapters on "The New Religion" and "The New Revelation". This "New" religion he summarizes as "the religion of the fatherhood of God, the brotherhood of man, and a universe that is home to them both. It is the Religion of Universal Truth.

ANIMALS LOOKING INTO THE FUTURE. By William A. Kepner. New York: The Macmillan Company. 1925.

An older and more complacent generation looked upon man as the only animal who takes thought for the morrow; Prof. Kepner gives us not new facts but a new viewpoint: he sharpens our consciousness of things we already know about animals, and shows that ants and even animalcules are endowed, each in his own kind, with a share of the fire of Prometheus. A very useful book for sluggish biophilosophical livers.

The apricot is a native of China.

Pork is the chief meat eaten by the Chinese.

A knife with 75 blades has been made by an English cutler.

The tiger is more intelligent than the lion, trainers say.
